CLAIMS

What is claimed is:

1. A method for increasing the concentration of gelsolin or functionally equivalent peptide fragment thereof, in blood or extracellular fluid of a patient *in vitro* or *in vivo*, wherein such increased concentration of gelsolin is needed, said method comprising administering to the patient a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof.

2. A method of preventing, neutralizing or reducing endotoxemia or endotoxin-induced septic shock in a patient *in vitro* or *in vivo*, wherein the patient is subject to or susceptible to gram negative bacterial infection, said method comprising administering a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof, to protect the patient from endotoxemia or endotoxin-induced sepsis.

3. A method for decreasing the concentration of bacterial LPS in blood or extracellular fluid of a patient *in vitro* or *in vivo*, wherein the patient is subject to or susceptible to bacterially produced LPS, and LPS concentration is increased above pre-infection concentrations, said method comprising administering a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof, thereby decreasing the concentration of bacterial LPS.

4. A method for blocking, reducing or ameliorating bacterial LPS-induced disruption of mammalian cellular responses or formation of toxic structures *in vitro* or *in vivo*, wherein the mammalian cells are, or will be, exposed to increased levels of bacterial LPS, said method comprising administering a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof, thereby affecting or blocking bacterial LPS-induced responses or formation of toxic structures in the mammalian cells.

5. A method for blocking, reducing or ameliorating the inhibition of fibrinolysis by excess, extracellular free actin in blood or extracellular fluid of a patient *in vitro* or *in vivo*, wherein the patient is subject to or susceptible to excess free actin, comprising the step of administering a therapeutically effective amount of at least one actin-binding compound comprising gelsolin, or functionally equivalent peptide fragment thereof, thereby binding the extracellular free actin.

6. A method of restoring or maintaining normal aggregation of platelets in a patient, wherein the patient is subject to or susceptible to LPS-induced generalized coagulation dysfunction, said method comprising administering a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof, thereby affecting platelet function.

7. The method of treating a patient in accordance with any one of claims 1-6, wherein the therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof, is administered to the patient.

8. The method of claim 7, wherein following administration of the therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof, the patient's blood or extracellular fluid comprises an increased concentration of gelsolin, as compared with the level of gelsolin before administration.

9. The method of either claim 7 or 8, wherein the increased concentration of gelsolin in the patient protects the patient from endotoxemia or endotoxin-induced sepsis.

10. The method of any of claims 7-9, wherein the increased concentration of gelsolin in the patient decreases the concentration of bacterial LPS in the patient.

11. The method of any of claims 7-10, wherein endotoxemia or endotoxin-induced sepsis in the patient is LPS-induced following the bacterial infection or triggering of endotoxins in the patient.

12. The method of either claim 7 or 8, wherein the increased concentration of gelsolin in the patient decreases, ameliorates or prevents bacterial LPS-induced disruption of the patent's cellular responses or formation of toxic structures.

13. The method of either claim 7 or 8, wherein the increased concentration of gelsolin in the patient restores or maintains normal aggregation of platelets in the patient, who is otherwise subject to or susceptible to LPS-induced generalized coagulation dysfunction.

14. The method for inhibiting, ameliorating or preventing secondary tissue injury in a patient resulting from an accumulation of excess bacterial LPS, said method comprising administering a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof in accordance with any of claims 7-13.

15. The method of claim 14, wherein the secondary tissue injury in the patient is remote from the site of primary infection or trauma.

16. The method of claim 1-15, further comprising enhancing the endogenous LBP (LPS binding protein) activity, thereby inhibiting, ameliorating, or preventing incorporation of LPS into blood lipoproteins of the patient.

17. The method for inhibiting, ameliorating or preventing pathogenesis of microvascular dysfunction, inflammation-induced pulmonary microvascular dysfunction or adult respiratory distress/multiple organ dysfunction syndrome (ARDS), platelet agglutination, thrombus development, venous obstruction, endothelial injury; pulmonary microthrombii, and/or organ injury at sites remote from primary trauma in a patient resulting from an accumulation of excess bacterial LPS or endotoxins triggered thereby, said method comprising administering a therapeutically effective amount of gelsolin, or functionally equivalent peptide fragment thereof in accordance with any of claims 7-16.

18. The method of any one of claims 1-17, wherein the gelsolin, or functionally equivalent peptide fragment thereof, comprises plasma gelsolin.

19. The method of any one of claims 1-18, wherein the gelsolin, or functionally equivalent peptide fragment thereof, comprises amino acid residues 160-169 of gelsolin

20. The method of any one of claims 1-19, wherein the gelsolin, or functionally equivalent peptide fragment thereof, comprises recombinantly produced or expressed plasma gelsolin.

21. The method of any one of claims 1-20, wherein the gelsolin, or functionally equivalent peptide fragment thereof, comprises SEQID No:1.

22. A method of predicting adverse clinical outcome associated with massive inflammation in a patient susceptible to inflammatory shock or endotoxin-induced sepsis, said method comprising measuring the circulating gelsolin concentration in the patient, wherein a decrease $\leq$ 30% of normal, pre-trauma or pre-infection gelsolin levels predicts such adverse outcome and predicts a need for gelsolin therapy.

23. The method of claim 22, comprising the use of fluorescent phosphorylated inositol phospholipid derivatives or tritium labeling as a method for detecting an endotoxin in an *in vitro* sample.

24. A pharmaceutical composition for use in the methods of any of claims 1-23 comprising:

(1) gelsolin, or functionally equivalent peptide fragment thereof, wherein such gelsolin or said fragment is substantially free of natural contaminants; and

(2) a pharmaceutically acceptable vehicle.

25. The pharmaceutical composition in accordance with claim 24, further comprising a sufficient amount of Ca^{2+} to activate the binding capability of exogenously administered gelsolin

26. Methods of using the pharmaceutical composition in accordance with claim 24 in the presence of a sufficient amount of Ca^{2+} to activate the binding capability of exogenously administered gelsolin for any of the methods of claims 1-23.